

**AMENDMENT TO THE CLAIMS:**

Please cancel claims 1–20 without prejudice. Please add the following new claims:

1           21.   (Newly Added) A voltage controlled oscillator (VCO) receiving positive and  
2 negative control voltages an oscillation frequency of a signal is based, the VCO comprising:

3                   a storage capacitor linearly charged by a constant charge current and linearly  
4 discharged by a constant discharge current;

5                   a comparator comparing a voltage on the storage capacitor to upper and lower  
6 threshold voltages, wherein an output of the comparator drops to a negative saturation voltage when  
7 the storage capacitor voltage exceeds one of the upper and lower threshold voltages and rises to a  
8 positive saturation voltage when the storage capacitor voltage exceeds the other of the upper and  
9 lower threshold voltages;

10                  a constant charge current source injecting constant charge current to the storage  
11 capacitor when the comparator output rises to one of the positive and negative saturation voltages;  
12 and

13                  a constant discharge current source draining constant discharge current from the  
14 storage capacitor when the comparator output drops to the other of the positive and negative  
15 saturation voltages.

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**CONTINUATION APPLICATION**

1           22.   (Newly Added) The VCO as set forth in Claim 21, wherein the comparator output  
2   is coupled to the VCO output.

1           23.   (Newly Added) The VCO as set forth in Claim 22, wherein the constant charge  
2   current is determined by the positive control voltage.

1           24.   (Newly Added) The VCO as set forth in Claim 23 wherein the constant discharge  
2   current is determined by the negative control voltage.

1           25.   (Newly Added) The VCO as set forth in Claim 23, wherein the constant charge  
2   current source comprises a bipolar junction transistor having a base coupled to the positive control  
3   voltage, an emitter coupled to the comparator output via a load resistor, and a collector coupled to  
4   the storage capacitor.

1           26.   (Newly Added) The VCO as set forth in Claim 23, wherein the constant discharge  
2   current source comprises a bipolar junction transistor having a base coupled to the negative control  
3   voltage, an emitter coupled to the comparator output via a load resistor, and a collector coupled to  
4   the storage capacitor.

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1           27.   (Newly Added) The VCO as set forth in Claim 22, wherein the constant charge  
2   current is determined by the negative control voltage.

1           28.   (Newly Added) The VCO as set forth in Claim 27, wherein the constant discharge  
2   current is determined by the positive control voltage.

1           29.   (Newly Added) The VCO as set forth in Claim 27, wherein the constant charge  
2   current source comprises a bipolar junction transistor having a base coupled to the negative control  
3   voltage, an emitter coupled to the comparator output via a load resistor, and a collector coupled to  
4   the storage capacitor.

1           30.   (Newly Added) The VCO as set forth in Claim 27, wherein the constant discharge  
2   current source comprises a bipolar junction transistor having a base coupled to the positive control  
3   voltage, an emitter coupled to the comparator output via a load resistor, and a collector coupled to  
4   the storage capacitor.

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**CONTINUATION APPLICATION**

1           31.   (Newly Added) The VCO as set forth in Claim 21, wherein the comparator  
2 comprises:

3                   an operational amplifier having a first input coupled to said storage capacitor;  
4                   a first resistor having a first terminal coupled to an output of the operational amplifier  
5 and a second terminal coupled to a second input of the operational amplifier; and

6                   a second resistor having a first terminal coupled to ground and a second terminal  
7 coupled to the second input of the operational amplifier,

8                   wherein the operational amplifier output is the comparator output.

1           32.   (Newly Added) The VCO as set forth in Claim 21, wherein the constant charge  
2 current is determined by a difference between the positive saturation voltage and the positive control  
3 voltage and the constant discharge current is determined by a difference between the negative  
4 saturation voltage and the negative control voltage.

1           33.   (Newly Added) A processing system including the VCO according to claim 21, the  
2   processing system comprising:  
3               a clocked circuit operating at a frequency defined by an external clock signal; and  
4               a phase-locked loop coupled to the clocked circuit and supplying the external clock  
5   signal, the phase-locked loop comprising:  
6               a frequency divider dividing a frequency of the external clock signal by N;  
7               a phase detector detecting a phase difference between a frequency divided  
8   output of the frequency divider and an input reference signal and generating a phase  
9   difference signal based upon the detected phase difference;  
10              a charge pump and loop filter circuit converting the phase difference signal  
11   to the positive and negative control voltages; and  
12              the VCO.